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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,114	07/09/2003	Jian-gang Weng	200208154-1	2605

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EXAMINER

KEBEDE, BROOK

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,114

Applicant(s)

WENG ET AL.

Examiner

Brook Kebede

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-20 and 33 is/are allowed.
- 6) ☒ Claim(s) 21-24, 27-32 and 34 is/are rejected.
- 7) ☒ Claim(s) 25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Claim Objections***

1. Claim 30 objected to because of the following informalities:

Claim 30 recites the limitation "The method of claim 29," in line 1. However, the recited claim lacks proper antecedent basis. The examiner respectfully suggests changing "method" to – device-- in order to maintain proper antecedent basis and consistency though out the claim language. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 29 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirai et al. (US/2003/0047729).

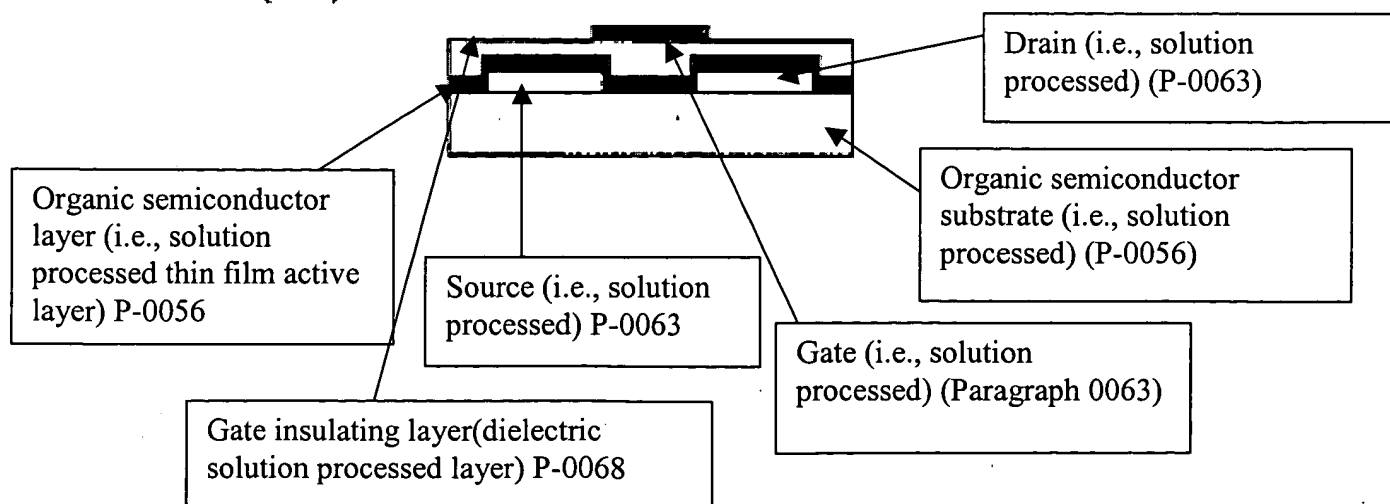
FIG. 1 (b)

FIG. 1 (e)

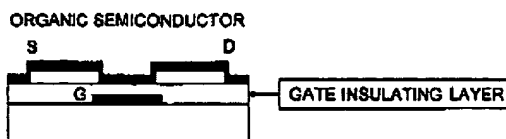
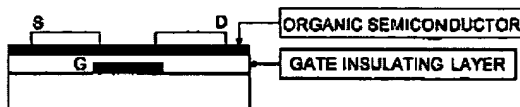


FIG. 1 (f)



Re claim 29, Hirai et al. disclose a solution-processed thin film transistor including drain, source and gate contacts formed of conductive solution-processed thin film materials (see Fig. 1(b)), a semiconductor solution-processed thin film material active region contacting the drain and source contacts (see Fig. 1(b)) and isolated from the gate contact by a dielectric solution-processed thin film material (see Fig. 1(b)), the transistor being formed by a process comprising, depositing in a rough pattern, the drain and source contacts, and refining the rough pattern by selective laser ablation of the drain and source contacts (see Fig. (1b); and Page 3, Paragraph 0056 through Page 9, Paragraph 0134).

Re claim 30, as applied to claim 29 above, Hirai et al. disclose all the claimed limitations including the limitation wherein the step of refining creates a transistor channel (see Fig. 1(b) and Page 5, Paragraph 0064).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 21-24, 27, 28, 31, 32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai et al. (US/2003/0047729), as applied in Paragraph 5 above, in view of Kian et al. (US/6,602,790).

Re claims 21 and 34, Hirai et al. disclose a solution-processed thin film transistor formation method, comprising steps of: forming solution-processed thin film layers into a transistor structure (see Figs. 1(a) – 1(f)), wherein the transistor structure includes a semiconductor solution-processed thin film active region, and a dielectric solution-processed thin film isolation; and during the forming, patterning portions of the transistor structure via laser ablation and the transistor structure includes a solution-processed thin film contact (see Figs. 1(a)-1(f); and Page 5, Paragraph 0064).

Although it is within the scope Hirai et al. disclosure, Hirai et al. do not specifically disclose selective ablating uses a laser wavelength tuned to be absorbed by material being ablated and to minimally damage material underlying material being ablated.

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Kian et al. disclose selectively ablating multilayered conductor/substrate structure using a laser wavelength tuned to be absorbed by material being ablated and to minimally damage material underlying material being ablated (see Col. 11, line 15 through Col. 12, line 65; Col. 19, line 8-67 through Col 20, line 13; Fig. 14). Kian et al. further disclose that “the typical plastic substrate, as compared to glass, has a surface topology with point-to-point variations both on a local scale and over a larger area. Surface variations on the order of several micro-meters are common. Layers formed over the plastic substrate may have a wavy surface or other surface variation. Generally the UV irradiation process is controlled to avoid ablating the plastic substrate and to leave a protective layer which is sufficiently thick to perform its protective function. Thus, in a preferred embodiment, the depth of focus of the laser is selected/controlled to be sufficiently large to take into account the above-described surface variabilities.” (see Col. 19, line 66 through Col. 20, line 13).

One of ordinary skill in the art would have been motivated to use the laser selective ablating uses a laser wavelength tuned to be absorbed by material being ablated and to minimally damage material underlying material being ablated because the radiation can be controlled and ablating (etching) of the substrate or underlying layer can be avoided.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Hirai et al. reference with selective ablating uses a laser wavelength tuned to be absorbed by material being ablated and to minimally damage material underlying material being ablated as taught by Kian et al. because the radiation can be controlled and ablating (etching) of the substrate or underlying layer can be avoided.

Re claim 22, as applied to claim 21 above, both Hirai et al. and Kian et al. in combination disclose all the claimed limitations including the limitation wherein said step of patterning is applied to complete patterning of a material roughly patterned when deposited (see Hirai et al. Figs. 1(a) – 1(f) and Kian et al. Col. 19, line 66 through Col. 20, line 13).

Re claim 23, as applied to claim 22 above, both Hirai et al. and Kian et al. in combination disclose all the claimed limitations including the limitation wherein the material roughly patterned when deposited is patterned as a result of an inkjet deposition process (Hirai et al. Figs. 1(a) – 1(f), Page 5, Paragraph 0064; and Kian et al. Col. 19, line 66 through Col. 20, line 13).

Re claim 24, as applied to claim 22 above, both Hirai et al. and Kian et al. in combination disclose all the claimed limitations including the limitation wherein the material roughly patterned when deposited is patterned as a result of a spin coat deposition process (Hirai et al. Figs. 1(a) – 1(f), Page 4, Paragraph 0061; and Kian et al. Col. 19, line 66 through Col. 20, line 13).

Re claim 27, as applied to claim 21 above, both Hirai et al. and Kian et al. in combination disclose all the claimed limitations including the limitation wherein said step of patterning is conducted through an optical mask to ablate multiple features simultaneously (see Hirai et al. Figs. 1(a)-1(f); see Kian et al Col. 11, line 15 through Col. 12, line 65; Col. 19, line 8-67 through Col 20, line 13; Fig. 14).

Re claim 28, as applied to claim 21 above, both Hirai et al. and Kian et al. in combination disclose all the claimed limitations including the limitation wherein said step of patterning is carried out while varying one or both of a laser wavelength and intensity simultaneously (see Hirai et al. Figs. 1(a)-1(f); see Kian et al. see Col. 11, line 64 – Col. 18 line 5).

Re claim 31, as applied to claim 29 in Paragraph 4 above, Hirai et al. disclose all the claimed limitations including the limitation selectively ablating of the solution processed conductive material to form source, drain, and gate contacts (see Fig. 1(b), 1(e), and 1(f); and Page 5, Paragraph 0064).

Although it is within the scope of Hirai et al. disclosure, Hirai et al. do not specifically disclose wherein the step of selectively ablating is conducted through an optical mask to ablate multiple features simultaneously.

Kian et al. disclose conducting of selective ablating through an optical mask (1408) (see Fig. 14) in order to form multiple features simultaneously (see Col. 11, line 15 through Col. 12, line 65; Col. 19, line 8-67 through Col 20, line 13; Fig. 14).

One of ordinary skill would have been motivated to perform selective ablating through an optical mask in order to form a desired pattern future on the film.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Hirai et al. reference with selectively ablating is conducted through an optical mask as taught by Kian et al. in order to form a desired pattern futures on the film.

Re claim 32, as applied to claim 29 in Paragraph 4 above, Hirai et al. disclose all the claimed limitations including the limitation selectively ablating of the solution processed conductive material to form source, drain, and gate contacts (see Fig. 1(b), 1(e), and 1(f); and Page 5, Paragraph 0064).

However, Hirai et al. do not specifically disclose the selectively ablating is carried out while varying one or both of a laser wavelength and intensity.

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Kian et al. disclose selectively ablating of the conductive layer such as ITO layer and varying the wavelength the laser light in order to determine the optimum wavelength for particular ablating process (see Col. 11, line 64 – Col. 18 line 5).

One of ordinary skill would have been motivated to perform selective ablating while varying of a laser wavelength in order in order to determine the optimum wavelength for particular ablating process.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Hirai et al. reference with selectively ablating while varying of a laser wavelength as taught by Kian et al. in order in order to determine the optimum wavelength for particular ablating process.

Re claim 34, as applied to claim 21 above, Hirai et al. and Kian et al. in combination disclose all the claimed limitations including the limitation wherein selectively ablating includes a conductive solution-processed thin film (i.e., solution-processed source **S** and drain **D** contact film) (see Figs. 1(a) – 1(f); and see Page 3, Paragraph 0056 through Page 9, Paragraph 0134).

Allowable Subject Matter

6. Claims 1-20 and 33 are allowed over prior art of record.
7. Claims 25 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicants' arguments filed on September 13, 2004 have been fully considered but they are not persuasive.

Applicants' arguments with respect to claims 1-20 and 33 are moot in view of the allowable subject matter of Paragraph 6 above.

With respect to claim 29, applicants argue that "Hirai reference does not teach, depositing in a rough pattern, the source and drain contacts, and refining the roughly pattern by selective laser ablation..."

In response to applicants' argument, it is respectfully submitted that Hirai et al. disclose all the claimed limitations of claim 29 including "depositing in a rough pattern, the source and drain contacts, and refining the roughly pattern by selective laser ablation." As shown in Figs. 1(b), 1(e) and 1(f) above, the source/drain and gate contacts are solution-processed layers deposited by printing which inherently have rough pattern and the laser ablation described by Hirai et al. provides selective patterning.

Therefore, the limitation is within the scope of Hirai et al. disclosure and the rejection under 35 U.S.C. 102 is deemed proper.

With respect claim 21, applicants argue that "Hirai reference does not described patterning, via laser ablation, portion of transistor, which includes conductive solution-processed thin film contacts, semiconductor processed thin film active regions, and semiconductor-solution processed thin film isolations..."

In response to applicants' argument, it is respectfully submitted that the combination of Hirai et al. and Kian et al. teach all the claimed limitation. Laser ablation of source/drain and gate contacts as disclose in the combination of Hirai et al. and Kian et al. meets the claim language.

Furthermore, it is respectfully submitted that the limitations as contented by applicants , i.e., laser ablation of “semiconductor processed thin film active regions” and “semiconductor-solution processed thin film isolations” are not part the rejected claims. The rejected claims are to given their broadest reasonable interpretation in light of the supporting disclosure. See *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See also *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

Therefore, the *prima facie* case of obviousness has been met and the rejection under 35 U.S.C. § 103 is deemed proper.

Conclusion

9. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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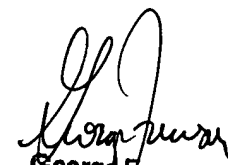
Correspondence

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brook Kebede whose telephone number is (571) 272-1862. The examiner can normally be reached on 8-5 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BK
June 8, 2004


George Fourson
Primary Examiner